National Park Service
U.S. Department of the Interior

Cuyahoga Valley National Park
Ohio

CUYAHOGA VALLEY NATIONAL PARK

DEER MANAGEMENT PLAN

FINAL INTERNAL SCOPING REPORT

CUYAHOGA VALLEY NATIONAL PARK

April 26, 2006

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PURPOSE OF AND NEED FOR ACTION

The 33,000 acres of Cuyahoga Valley National Park include relatively undeveloped land situated between the two major metropolitan areas of Cleveland and Akron, Ohio. Surrounded by residential and industrial development and transportation corridors, the National Park Service owns approximately 18,600 acres within the legislative boundary of the park. Most of the remaining area is owned and managed by public and quasi-public entities such as Cleveland Metroparks, Metro Parks, Serving Summit County, Blossom Music Center, the Boy Scouts of America, the Girl Scouts of America, the Phyllis Wheatly Association, and the Western Reserve Historical Society. A little more than 4,000 acres are owned by private individuals.

An internal scoping meeting was held October 23 and 24, 2003, to discuss the management of white-tailed deer (*Odocoileus virginianus*) as part of a healthy and functioning ecosystem at Cuyahoga Valley National Park (see Appendix A). The goal of this meeting was to determine the purpose, need, and objectives for managing deer at the park, as well as to identify issues and concerns associated with the current deer populations and their impact on the park ecosystem. Preliminary alternatives were also discussed.

White-tailed deer occur throughout the contiguous United States with the exception of portions of the Southwest (Coffey 1999). Prior to European settlement, North American white-tailed deer populations are estimated to have been between 23 and 24 million or about 8–11 deer per square mile (McCabe and McCabe 1984). These deer population numbers declined dramatically in the eastern U.S. after European settlement. In the state of Ohio, abundant deer populations declined to near extirpation from European settlement to the early 1900s due to the accelerated clearing of forested land (80-90% of forested land in Ohio was cleared) and unrestricted hunting (Dennis 1983, Stoll and Donohoe 1973). Reestablishment of the herd began in the 1930s due to immigration of deer from Michigan and Pennsylvania, a restocking effort in southern Ohio, implementation and enforcement of harvest regulations, and improved habitat due to the conversion of abandoned agricultural land to early successional habitat (Stoll and Donohoe 1973). In 1965 there were an estimated 17,000 deer in the state, by 1970 over 30,000, and by 1994, more than 400,000.

The Ohio Department of Natural Resources, Division of Wildlife estimates Ohio's deer herd to be approximately 681,000 (ODNR 2003). In the eastern United States, white-tailed deer populations have grown dramatically over the past four decades (Porter 1991). This growth has placed increasing demands on natural resources and open space in the region and often results in a negative impact on other natural resources such as vegetation and wildlife (Porter 1991; DeNicola et al 2000; NPS 2002a).

SUMMARY OF DEER MANAGEMENT IN CUYAHOGA VALLEY NATIONAL PARK

White-tailed deer in Cuyahoga Valley National Park are a native species whose primary natural predators have long been extirpated from the region. This, combined with the fact that hunting is not allowed on park lands, has allowed the deer population at Cuyahoga Valley National Park to grow to unprecedented levels (NPS 1997a). Deer browsing from this large population is affecting forest regeneration, understory vegetation and habitat, and species diversity and composition (Petit 1998; NPS 2002b; 2002c). In 1993, a Deer Management Task Force (DMTF) was established by the Cuyahoga Valley Communities Council, a partnership of local and county governments, school and

park districts, and the National Park Service working together to foster communication, realize opportunities, and resolve problems for the mutual benefit of its members (Cuyahoga County Board of County Commissioners 2004). Cuyahoga Valley National Park (at that time a National Recreation Area) was a member of the DMTF along with eleven representatives from six local municipalities and townships, both Cleveland and Summit County metro parks districts, the Ohio Farm Bureau, and the Ohio Department of Natural Resources. The task force studied the issue of the deer population within a 178 square mile Area of Concern centered on the national park and including public and private lands. The DMTF's recommendations were presented to Cuyahoga Valley Communities Council in 1996. The task force recommended deer population control within the Area of Concern because (NPS 1997a; DMTF 1996):

- Measures to reduce conflicts with deer would help but were not sufficient.
- The extent of damage to residential gardens, landscaping, and farm crops and the number of roadway accidents supported the need to reduce the deer population.
- The density of the deer population exceeded the level at which substantial impacts on natural resources were associated, and was well within the range at which intolerable conflicts with human activities were associated.
- There was public support for deer population control. A DMTF public survey found that 52 percent of respondents agreed that problems warranted control; however, the survey item did not suggest a type of control method.
- Action should not be delayed.

The task force recommended four methods of deer population control (NPS 1997a):

- Public sport hunting in areas where legal, practical, feasible, and safe.
- Specially controlled hunting on isolated land areas of greater than five acres.
- Sharpshooting in areas which are not suitable for public sport hunting or specially controlled hunting.
- Capture/euthanasia in developed areas where other methods are not practical or safe.

Cuyahoga Valley National Park drafted a deer management plan and an associated environmental assessment in 1997. On December 10, 1997, the U.S. District Court granted a preliminary injunction against the National Park Service which prohibited the proposed culling from taking place. Shortly thereafter, the NPS withdrew its deer management plan and filed a motion to dismiss the case, which was accepted by the plaintiffs in the case, the Animal Protection Institute and other animal advocacy groups (see Animal Protection Institute v. Stanton, Civil Action No. 97-2563 (D.D.C. Dec. 10, 1997)).

The park has monitored deer population change using a roadside spotlight survey since 1990. A dead deer survey, conducted from 1992 to 1999, provided initial information on herd health. Additional population size and distribution information was gained from aerial surveys (1996-1998) and fecal pellet group surveys (1996-present). Annual monitoring of deer browse impacts on the forest wildflower, *Trillium grandiflorum*, began in 1996. Following the legal challenge of the 1997 environmental assessment and management plan, additional studies were initiated to measure and monitor deer impacts to park resources, including a study of deer browse impacts on forest songbirds

(1997-2000), and establishing deer exclosures (1999-present) and long-term vegetation monitoring sites (1998-present). A systematic survey of herd health was conducted from 1997-2001 and the annual spotlight survey was modified to include distance sampling for better population density estimation (1998-present). Those population monitoring and impact studies suggest that the deer population has increased substantially over the past 15 years and that the increased population is impacting understory vegetation, songbird habitat, and other park resources.

PURPOSE OF AND NEED FOR ACTION

As defined in the DO #12 Handbook, section 2.2:

Purpose is a broad statement of goals and objectives that NPS intends to fulfill by taking action . . . Objectives are a more specific statement of purpose, i.e., what must be accomplished in a large part for the action to be considered a success.

Need is a discussion of existing conditions that need to be changed, problems that need to be remedied, decisions that need to be made, and polices or mandates that need to be implemented . . . Need is why action is being taken at this time.

The purpose of this plan and environmental impact statement is to develop a deer management plan that supports long-term protection, preservation, and restoration of native species and other park resources.

A deer management plan is needed to ensure that:

- Deer do not become the dominant force in the ecosystem adversely impacting forest regeneration, sensitive vegetation and other wildlife.
- Natural distribution, abundance, and diversity of plant and animal species do not continue to be adversely affected by the large number of white-tailed deer in Cuyahoga Valley National Park.
- Declining forest regeneration is addressed and deer browsing does not continue at a level that eliminates or reduces forest regeneration, and that adverse changes to wildlife habitat and forest structure and composition do not occur over time.
- The park's cultural landscape preservation goals and mandates are not compromised by the large number of white-tailed deer in Cuyahoga Valley National Park.
- The protection of park resources and values benefits from coordination with other jurisdictional entities currently implementing deer management actions.

OBJECTIVES IN TAKING ACTION

Objectives are "what must be achieved to a large degree for the action to be considered a success" (Director's Order 12). All alternatives selected for detailed analysis must meet all objectives to a large degree, and resolve purpose and need for action. Objectives for managing deer populations must be grounded in the park's enabling legislation, purpose, significance, and mission goals and be compatible with direction and guidance provided by the general management plan. The following are the objectives related to deer management derived with park staff at the internal scoping meeting.

MANAGEMENT METHODOLOGY

- Develop and implement informed, scientifically defensible vegetation and wildlife impact levels and corresponding measures of deer population size that would serve as thresholds for taking adaptive management actions within the park.

WILDLIFE AND WILDLIFE HABITAT

- Prevent deer behavior, including browsing, trampling, and seed dispersal, from adversely impacting the natural abundance, distribution, and diversity of plant and animal species within the park.
- Protect habitat of threatened and endangered species from adverse impacts related to deer behavior, including browsing, trampling, and seed dispersal.
- Maintain a healthy white-tailed deer population within the park while protecting other park resources.

VEGETATION

- Ensure that deer behavior, including browsing, trampling, and seed dispersal, does not adversely affect:
    - Natural abundance, distribution, and diversity of native herbaceous and woody plant species.
    - Native vegetative species of concern, including rare, threatened or endangered species.
    - Native vegetative species through dispersal, spread, and facilitation of exotic, invasive species.

CULTURAL RESOURCES

- Ensure that deer behavior does not adversely affect the cultural landscape.

VISITOR EXPERIENCE

- Enhance public awareness and understanding of NPS resource management issues, policies, and mandates, as they pertain to deer management.
- Ensure visitors the opportunity to view healthy deer in the natural environment at population levels that do not adversely impact visitors' enjoyment of other native species in the natural landscape.

STUDY AREA AND SCOPE OF THE ANALYSIS

Public understanding and support for any future efforts to maintain deer populations as a healthy component of the park ecosystem is extremely important. Because the issue of deer management is of great public controversy, an environmental impact statement is the most appropriate compliance pathway for this process.

The focus of the analysis will be to develop deer management methods and strategies for Cuyahoga Valley National Park in cooperation with local, state, and regional entities as well as other federal agencies. A technical committee is proposed to assist with the planning process by: evaluating scientific literature and research on the topic of deer management; reviewing and recommending monitoring protocols for park deer populations and other park resources; and identifying appropriate resource thresholds at which deer management strategies would be implemented. Monitoring protocols and impact thresholds will be incorporated into all action alternatives evaluated in analysis. Established thresholds will reflect the objectives to maintain the deer population as one component of a balanced, functioning ecosystem and to prevent deer from being a dominant component that adversely impacts other park resources or values. Deer management strategies developed through this analysis will be adaptive and dynamic, allowing for the incorporation of new scientific information over time that may modify impact thresholds or management methods to best meet objectives in taking action.

BACKGROUND

NPS units were established by Congress to fulfill specified purposes, based upon the park's unique and "significant" resources. A park's purpose, as established by Congress, is the fundamental building block for its decisions to conserve resources while providing for "enjoyment of future generations."

The following were explored with the park: why the unit was established as a park; what resources Congress recognized as needing NPS protection, and what purpose, mission, and objectives must be fulfilled by the park. After an impact analysis is completed on the alternatives, the issue of whether or not deer management actions fit into the purpose of the park, as defined by its enabling legislation will be revisited.

The park's Strategic Plan, General Management Plan, and 1999 Draft Resource Management Plan summarize its authorizing legislation, its purpose and significance, as well as broad mission goals for the future. These statements were reviewed at the internal scoping meeting and are presented in this section.

CUYAHOGA VALLEY NATIONAL PARK LEGISLATION AND PLANNING DOCUMENTS

PURPOSE AND SIGNIFICANCE OF CUYAHOGA VALLEY NATIONAL PARK

Establishment — Cuyahoga Valley National Recreation Area (designated a National Park in 2000) was established on December 27, 1974 through law PL 93-555. This enabling legislation established the park

> "For the purpose of preserving and protecting for public use and enjoyment, the historic, scenic, natural, and recreational values of the Cuyahoga River and the adjacent lands of the Cuyahoga Valley and for the purpose of providing the maintenance of needed recreational open space necessary to the urban environment, the Cuyahoga Valley National Park, [sic] shall be established within six months after December 27, 1974."

The legislation further stated that, "The Secretary of the Interior shall utilize the park resources in a manner which will preserve its scenic, natural, and historic setting while providing for the recreational and educational needs of the visiting public."

Purpose — The park's purpose is to:

- Preserve and protect for public use and enjoyment, the historic, scenic, natural, and recreational values of the Cuyahoga River and the adjacent lands of the Cuyahoga Valley.
- Provide for the maintenance of needed open space necessary to the urban environment.
- Provide for the recreational and educational needs of the visiting public.

- Assist in the preservation and interpretation of the natural, recreational, scenic, historical, and cultural resources within the Ohio & Erie Canal National Heritage Corridor.

Significance — The park's primary significance is its preservation and interpretation of a major portion of the Cuyahoga River Valley which includes a rich diversity of cultural and natural resources including:

- the Cuyahoga River, one of only 14 designated American Heritage Rivers in the United States;
- the nationally significant Ohio & Erie Canal;
- numerous prehistoric sites, 64 National Register listings including historic districts, historic structures, Civilian Conservation Corps sites, examples of settlement patterns reflecting the area's Western Reserve of Connecticut heritage, and the Valley Railroad;
- a thriving riparian ecosystem;
- scenic landforms that portray the area's Pleistocene glacial activity;
- one of the National Park Service's premier environmental education programs; and
- a wide variety of recreational opportunities provided by the National Park Service and numerous partners such as Hale Farm and Village, Cleveland Metroparks, Metro Parks, Serving Summit County, Blossom Music Center, two ski areas, and youth camps.

The park also forms a portion of the newly designated Ohio & Erie Canal National Heritage Corridor and performs a crucial role in assisting the Ohio & Erie Canal Association in developing the 87 mile corridor along the length of that historic canal.

CUYAHOGA VALLEY NATIONAL PARK PLANNING DOCUMENTS

The purpose, need, and objectives must be, to a large degree, consistent with park planning documents. These documents include the 1977 *General Management Plan*, 1993 *Statement for Management*, 1997 *Strategic Plan*, 2003 *Long-Range Interpretive Plan*, and 1999 *Draft Resource Management Plan*.

Cuyahoga Valley National Recreation Area General Management Plan 1977

The General Management Plan (1977) was prepared to provide a direction for park management during the land acquisition stage in the early development of the park. The primary planning concept identified in this document is resource preservation and enhancement for compatible recreational use. This plan includes a statement for management that identifies the objectives to be achieved at the park as well as the park's significance. The natural resource management objectives for the park, as established in this document are (NPS 1977):

- To preserve natural park lands under the concept of "total environment" or ecosystem perpetuation and ensure that all visitor-use activities are appropriate to their setting.

- To design park facilities to take advantage of natural climatic conditions and incorporate environmentally neutral technology wherever feasible.

- To cooperate with federal, state, and local agencies in the monitoring of environmental quality.

Statement for Management 1993

The Statement for Management inventories and analyzes influences on the park as well as determines the major issues of the park and management objectives. This document states that:

> The [recreation area]'s primary attribute lies in the fact that it preserves some 32,438 acres of relatively undeveloped and scenic open space in a pastoral valley lying less than 30 miles from 4 million residents of northeastern Ohio. Its significance is of course not limited to its potential to serve the recreational needs of this regional population. The river and valley contain important remnants of the Nation's natural and cultural heritage – features that can and will attract people from throughout the country. However, Cuyahoga's proximity to Cleveland and Akron increases its value immeasurably as a recreational resource for urban dwellers . . . In the long run; the greatest significance of this [recreation area] will be its value as a living, dynamic stage, spotlighting the changing relationship between humans and their environment.

Cuyahoga Valley National Park Strategic Plan 1997 (& 2000)

The 1997 *Strategic Plan* (1997b) covers a five-year period and provides mission goals, as well as a way to accomplish those goals. The plan includes long-term goals under each mission goal and estimation of costs associated with implementation of the strategic plan. The plan was updated in 2000.

Long-Range Interpretive Plan (LRIP) 2003

The park's 2003 *Long-Range Interpretive Plan (LRIP)* defines the vision and goals for interpretation and education through a process of stakeholder involvement.

Draft Resource Management Plan 1999

Park mission and goals, as stated in the 1999 *Draft Resource Management Plan*, include to:

> Preserve, protect, and manage the native animal life so it is compatible with other ecosystem components and park uses through:
>
> - Manage problematic native and non-native species or individuals when natural processes fail.
>
> - Develop a deer management plan when unacceptable resource or visitor impacts occur or are likely to occur.
>
> Preserve and protect native plant life and fungi so as to be compatible with the park ecosystem and park uses.

- Monitor populations, dynamics, habitats and other important factors for indicator species, sensitive species, threatened/endangered species and problem or potentially problematic species.

    - Monitor impacts of deer on Trillium populations.

Preserve, protect and restore the park ecosystem to the extent possible.

- Identify and define critical ecosystem components and processes through research to establish requirements, threats, and relationships.

- Monitor critical ecosystem components and processes to characterize condition, trends and responses to management actions.

Preserve individual sites and broad-pattern cultural landscapes that communicate human interaction with the ecosystem over time and provide a setting for the historic themes associated with the development of the Cuyahoga Valley.

NPS ORGANIC ACT AND MANAGEMENT POLICIES

By enacting the National Park Service Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC § 1a-1).

Despite these mandates, the Organic Act and its amendments afford the National Park Service latitude when making resource decisions that balance visitor recreation and resource preservation. By these acts Congress "empowered [the National Park Service] with the authority to determine what uses of park resources are proper and what proportion of the parks resources are available for each use" (*Bicycle Trails Council of Marin v. Babbitt,* 82 F.3d 1445, 1453 (9th Cir. 1996)).

Because conservation remains predominant, the National Park Service seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the National Park Service has discretion to allow negative impacts when necessary (*Management Policies 2001,* sec. 1.4.3); however, while some actions and activities cause impacts, the National Park Service cannot allow an adverse impact that constitutes resource impairment (*Management Policies 2001,* sec. 1.4.3). The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (*Management Policies 2001,* sec. 1.4.4). To determine impairment, the National Park Service must evaluate "the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts" (*Management Policies 2001,* sec. 1.4.4).

Park units vary based on their enabling legislation, natural resources, cultural resources, and missions; management activities appropriate for each unit and for areas within each unit vary as well. An action appropriate in one unit could impair resources in another unit. Thus, this environmental impact statement will analyze the context, duration, and intensity of impacts related to deer management within Cuyahoga Valley National Park, as well as the potential for resource impairment, as required by *Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2001).

FEDERAL LAWS, REGULATIONS, AND POLICIES

The National Park Service is governed by laws, regulations, and management plans before, during, and following any management action related to this environmental impact statement.

National Environmental Policy Act, 1969, as Amended

Section 102(2)(c) of this act requires that an environmental impact statement be prepared for proposed federal actions that may significantly affect the quality of the human environment or are major or controversial federal actions.

National Parks Omnibus Management Act of 1998 (NPOMA)

NPOMA (16 USC 5901 et seq.) underscores NEPA in that both are fundamental to National Park Service park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis should this be the case.

The *Omnibus Act* directs the National Park Service to obtain scientific and technical information for analysis. The National Park Service handbook for *Director's Order 12* states that if "such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact or other alternatives will be selected" (section 4.4).

Redwood National Park Act of 1978, as Amended

All National Park System units are to be managed and protected as parks, whether established as a recreation area, historic site, or any other designation. This act states that the National Park Service must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Code of Federal Regulations, 1992

Title 36, Chapter 1 provides the regulations "for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service." It states that "the National Park Service has the authority to manage the wildlife in the parks in fulfillment of the Organic Act without the consent of the state and by methods contrary to state law" (16 USC 3).

Endangered Species Act of 1973, as Amended

This act requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals having potential impact on federally endangered and threatened plants and animals.

Fish and Wildlife Coordination Act of 1934, as Amended

The Act authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The 1958 amendments added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs, and authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds (16 USC 661-667e).

National Historic Preservation Act of 1966, as Amended

Section 106 of this act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. All actions affecting the parks' cultural resources must comply with this legislation.

Historic Sites Act of 1935

This act declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It authorizes the Secretary of the Interior and National Park Service to restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archaeological significance.

Farmland Protection Policy Act (FPPA) of 1980

This act was created to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses.

Natural Resources Management Guideline, NPS-77, 1991

The purpose of this document is to provide guidance to park managers for all planned and ongoing natural resource management activities. Managers must follow all federal laws, regulations, and policies. This document provides the guidance for park management to design, implement and evaluate a comprehensive natural resource management program.

Federal Noxious Weed Act, 1974

The Federal Noxious Weed Act (7 USC §§ 2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.

Executive Order 13112 – Invasive Species

This executive order requires the National Park Service to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Executive Order 11990 - Protection of Wetlands

This executive order directs the National Park Service to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Executive Order 11988 - Floodplain Management

This executive order directs the National Park Service to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 11593 - Protection and Enhancement of the Cultural Environment

This executive order directs the National Park Service to support the preservation of cultural properties and to identify and nominate to the National Register cultural properties within the park and to "exercise caution . . . to assure that any NPS-owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered."

Executive Order 13186 – Protection of Migratory Birds

This executive order directs the National Park Service to avoid actions that have a measurable negative effect on migratory bird populations, and to promote the conservation of migratory bird populations.

STATE AND LOCAL LAWS, REGULATIONS, AND POLICIES

State of Ohio Hunting Regulations

The State of Ohio 2003-2004 Hunting Regulations dictate deer hunting seasons, permit requirements, number and type of deer allowed per hunter, tagging requirements, and allowable hunting equipment. Also included in these regulations is the establishment of Urban Deer Units and a wildlife disease update.

Chapter 1531 of the Ohio Revised Code: Division of Wildlife

Under Chapter 1531 of the Ohio Revised Code, the Ohio Division of Wildlife holds title to all wild animals not legally confined or held in private ownership. Any active management of deer herds must receive approval from the Ohio Department of Natural Resources, Division of Wildlife.

HISTORY OF DEER MONITORING AND RESEARCH AT CUYAHOGA VALLEY NATIONAL PARK

Within eastern national parks such as Cuyahoga Valley National Park, landscapes have been managed to allow for preservation and rehabilitation of natural, scenic, and historic lands. This often results in a mixture of forest, shrub, and grassland, which together constitute excellent habitat for white-tailed deer. Moreover, through prohibition of hunting, many national parks serve as refuges for deer and other wildlife species whose natural predators were long ago extirpated by human activities. The combination of high quality habitat and lack of predation results in rapid population growth. Today in

many areas of the eastern United States, the density of deer exceeds 40 deer/km^2 (100 deer/mi^2) (Porter 1991), and it has been established that deer densities this high can have negative impacts on plant and animal species (Alverson 1988, Anderson 1994, Augustine and Frelich 1998, DeCalesta 1994, McShea 2000, McShea and Rappole 2000).

Several national park units have been involved in deer management planning efforts and have served as examples of the high public emotion and controversy that surrounds the subject. Gettysburg National Military Park and Eisenhower National Historic Site completed an environmental impact statement and white-tailed deer management plan in 1995 and are currently implementing management strategies. Deer management planning efforts are occurring at Catoctin Mountain Park, Maryland and Indiana Dunes National Lakeshore, Indiana. Fire Island National Seashore in New York is researching immunocontraception as a means of population control for deer.

The issues surrounding resource management, including that of deer, are complex. Park managers are challenged with establishment of vegetation goals related to species abundance, diversity and habitat, and achievement of those goals in light of other environmental influences and the important role deer play in a balanced ecosystem. In addition, determining and monitoring the effects of deer and then deciding how and when to take appropriate action must be based upon best available science and professional judgment. Finally, the human component of this issue is substantive in that many people have different views of wildlife management in units of the National Park Service.

As in other eastern national parks, white-tailed deer at Cuyahoga Valley National Park have no significant natural predators. The park provides an island of habitat between two major cities, Cleveland and Akron and there is no hunting on NPS land, with only a few of the communities surrounding the park allowing hunting. The combination of these factors has facilitated the growth of the deer population at Cuyahoga Valley National Park. To determine the extent of deer-related impacts at Cuyahoga Valley National Park, studies on the deer population and on deer impacts to other resources have been implemented.

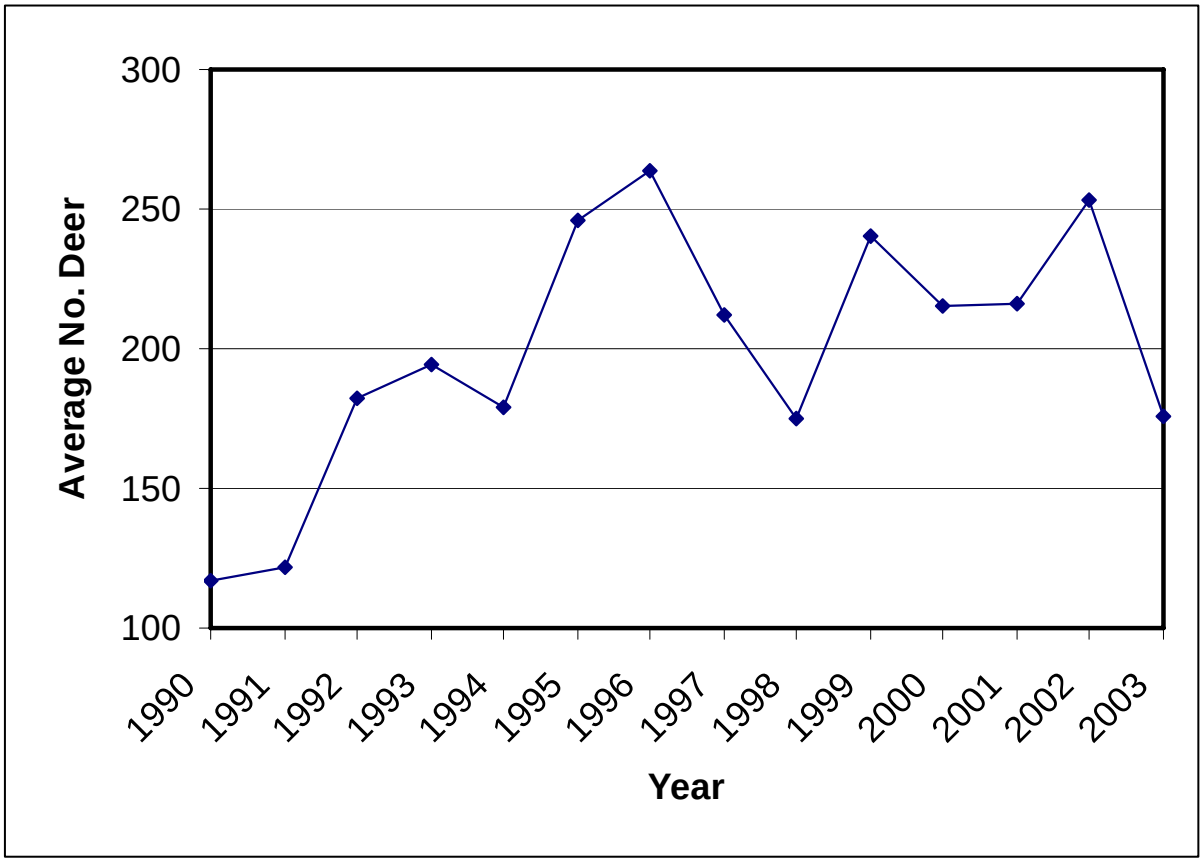
The following sections summarize the history of deer monitoring in Cuyahoga Valley National Park through the timeline of deer-related studies completed by the park.

CUYAHOGA VALLEY NATIONAL PARK DEER POPULATION SURVEYS

Deer population growth, density, and health at Cuyahoga Valley National Park have been measured through roadside spotlight surveys and distance sampling, aerial surveys, fecal pellet group surveys, dead deer surveys and a herd health survey.

Spotlight Survey (1990-Present)

Since 1990, the park has conducted annual spotlight surveys to monitor the deer population within Cuyahoga Valley National Park. These surveys are conducted on nearly 40 miles of roads and railroad, divided into 18 segments, each between 0.35 and 3.5 miles long. Data collection occurs every November over a five night period and the deer counts are based on eye shine from a spotlight. Data collected during the survey include number of deer observed, the presence or absence of antlers, and linear distance of deer from the road transect (added in 1998). These data provide population trends and a baseline for density estimates. Spotlight survey data (shown below) indicate that the deer



Source: L. Petit, NPS, February 4, 2004.

population increased steadily between 1990 and 1996, with numbers fluctuating, sometimes dramatically, after 1996.

Fecal Pellet Group Survey (1996-Present)

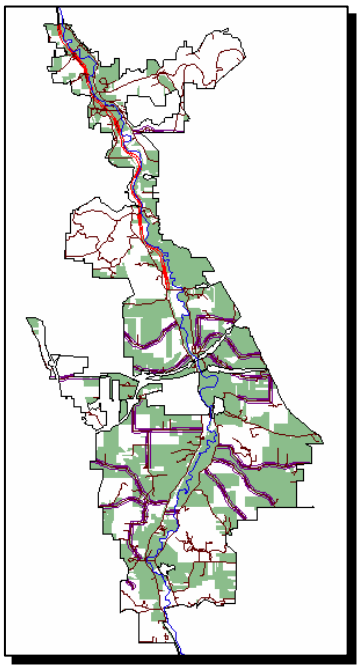
Fecal pellet surveys occur at a maximum of 170 sites throughout the park. The sites observed are 50 meter by 3 meter transects. The fecal pellet count occurs after snowmelt and provides an index of the winter distribution and relative abundance of deer. Aerial surveys were conducted by helicopter in the early spring months of 1996 and 1998 to validate fecal pellet survey information.

Density Estimation Using Distance Sampling (1998-Present)

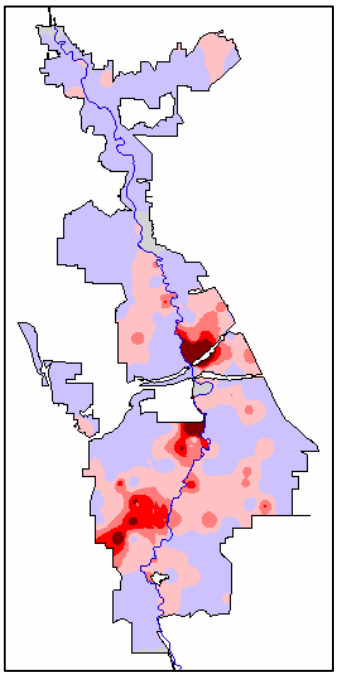
Distance sampling methods were added to spotlight survey protocols in order to derive better estimates of deer population density. By assigning to each group of deer a linear distance perpendicular to the survey segment transect, a sampling area is estimated and a density estimate derived using the statistical program DISTANCE. Spotlight survey road/railway segments were consolidated into five geographic zones of the park, and density estimates are derived for each zone. Density estimates in 1998 varied from 40-100 deer per square mile. In 1999, these estimates rose to 53-130 deer per square mile.

Dead Deer Surveys (1992-1999)

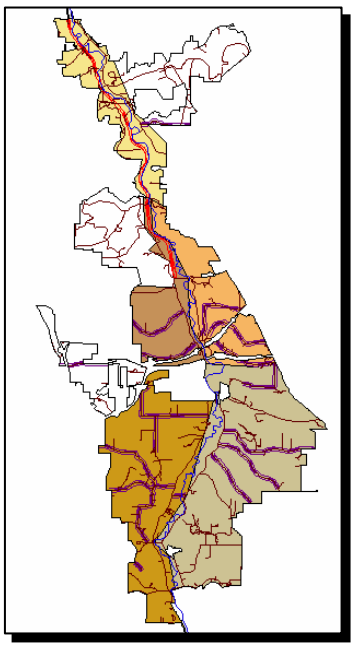
The park maintained records of dead deer found throughout the park. For each deer reported, the park recorded location, cause of death, sex, age, and total body weight determined from a girth tape. In addition, in 1996 a sample of bone marrow was taken to give an indication of body fat levels as an index of health. Two-thirds of the deer sampled had bone marrow condition rated as "good".



Deer Spotlight Roads



Deer Fecal Pellet Survey



Deer Density Estimation Zones

Herd Health (1997-2001)

The National Wildlife Health Center in Madison, Wisconsin conducted a survey of herd health between 1997 and 2001. Each year, a sample of 10 deer was taken to assess physiology, blood chemistry, and other physical health factors. Conclusions of the study found the herd health to be generally good. However, the population appeared to be exceeding carrying capacity based on fetus to doe ratios and percentage of pregnant fawns (USGS 2001).

CUYAHOGA VALLEY NATIONAL PARK IMPACT STUDIES

In addition to determining abundance and distribution of deer at Cuyahoga Valley National Park, the park is also conducting studies to determine the impacts of deer on other natural resources. Studies conducted to date include exclosure studies of deer browse impacts on *Trillium* and on forest and old field vegetation; Long-Term Ecological Monitoring of vegetation; a study of impacts on forest songbird nesting habitat; and a survey of social attitudes. These studies are discussed in detail below.

VEGETATION IMPACTS

Intense deer browsing on vegetation is a concern for park managers. Impacts include loss of plant species that may change diversity and structure of plant communities and potential impacts to dependent wildlife. Biological diversity in eastern forests has declined as deer seek out and consume highly preferred plant species. Large-flowered trillium (*Trillium grandiflorum*) is common to the region and is favored by deer. High deer densities can skew trillium populations toward small plants and can lead to extirpation of sensitive forbs such as trillium (Augustine and Frelich 1998). Population density as low as 8 deer/km^2 (21 deer/mile^2) may be too high to maintain the diversity of all plants and animal species in northern hardwood forests (Alverson 1988). Densities as low as 4 deer/km^2 (10 deer/mile^2) may prevent woody species such as white cedar (*Thuja occidentalis*) and some herbaceous species regeneration in northern Wisconsin (Alverson 1988). At high deer densities, if deer browsing activities are not controlled, browse availability for deer declines to the point that feeding by deer becomes much less selective (Hazel 1995). At that point, browse impacts become apparent in the form of a "browse line" from the ground up to 2 m in height. Most herbaceous and shrub species subsequently are eliminated (e.g., Tilghman 1989; Rhoads, n.d.).

Trillium Exclosures

Literature on deer impacts suggest that trillium is a good indication of deer impact because it is both a preferred browse species and a sensitive species that reproduces at stem heights of 12-14 cm. Generally, deer browse selectively on the tallest, flowering plants, and flowering of the plants decreases with increased browse (Anderson 1994). To measure deer impact on trillium, the park established 26 pairs of caged and control areas in 14 locations throughout the park. Stem heights and flowering were measured at these locations every two weeks. Trends in this study showed a higher number of flowers in enclosed areas vs. control areas because trillium inside cages were able to reach a stem height that allowed plants to flower.

Trillium Exclosure at Cuyahoga Valley National Park

Forest/Field Exclosures

The exclosure study began at Cuyahoga Valley National Park in 1991, with three sites. The study expanded in 1999 with the addition of 12 sites. Deer impact measurements are based primarily on these 12 added sites. Each 10 meter by 10 meter exclosure is paired with an equal-sized, unfenced "control" plot. Three replicates of exclosure/ control pairs occur in each of the following habitats: upland forest, bottomland forest, upland field, and bottomland field. On each plot, 57 parameters are measured including species

Deer Exclosure at Cuyahoga Valley National Park

diversity, foliage cover, and seedling regeneration. In the forest area, measurements taken after three growing seasons indicate that within the exclosure there is greater groundcover diversity, greater recruitment into taller seedling height categories, and better recruitment of black cherry (NPS 2002b). This study examines the complex variation among habitats, as well as looking at confounding effects such as gypsy moth impacts.

Long-term Ecological Monitoring (1998-2000)

The long-term ecological monitoring (LTEM) at Cuyahoga Valley National Park is evaluating vegetation and tree regeneration at 91 locations throughout the park. The same parameters measured in exclosures were also measured at LTEM sites. Deer impact level (high or low) was assigned to each site based upon change in the height of the tallest seedling over time. The results have shown areas of high deer impact declining in seedling abundance, seedling stocking, shrub cover, and groundcover diversity since 1998. Both bottomland and upland sites had similar impacts. It was also found that gypsy moth defoliation could partially counteract deer impacts and may facilitate the spread of exotics.

WILDLIFE IMPACTS

Over-browsing by deer can greatly reduce the biological diversity of plant communities, resulting in low diversity forest ecosystems. Animal species that are dependent upon these plant communities for habitat are also affected. Deer have become a major force in determining the structure of the natural community in some forest ecosystems (Rooney and Waller 2003).

Deer browsing has been shown to lead to a decline in nesting bird species richness by 27% and abundance by 37% (DeCalesta 1994) between low and high densities of deer. Increasing understory density and diversity by reducing deer density (McShea and Rappole 2000) can reverse the changes in bird communities and benefit migrant bird species. In oak-hickory forests deer feeding on acorns can depress eastern chipmunk (*Tamias striatus*) and white-footed mouse (*Peromyscus leucopus*) population numbers during low acorn mast years (McShea 2000).

Forest Song Bird Study (1997- 2000)

Cuyahoga Valley National Park conducted a forest songbird study to examine cascading effects of deer density and browse on the diversity and abundance of forest songbirds (Petit 1998). The study was conducted in 12 study plots located within areas of contiguous, mature, closed canopy forest in Cuyahoga Valley National Park and in adjacent Metropark areas. Pellet counts were used to classify areas as high deer density (greater than 30 deer/mi^2) or low density (less than 30 deer/mi^2). Birds and deer were surveyed using fixed-radius point counts. The study showed that in high deer density areas, bird species richness and abundance were lower. However, nesting success was higher, which may be attributable to less parasitism and predation in areas of high deer density and low bird abundance.

SURVEY OF SOCIAL ATTITUDES

This study was conducted by the University of Minnesota (Dougherty et al. 2001) to quantify the social attitudes of residents adjacent to and further removed from Cuyahoga Valley National Park. This study found that the majority of the respondents supported deer management, including lethal methods. Furthermore, the majority of respondents trust NPS in their decision making on this issue. Although the study found public support for deer management, it also showed a difference in public

perception of the need for deer management (i.e., reduce automobile accidents, browsing on landscape plants, etc.) compared to the park's perception (i.e., preserve and protect native species). The survey suggested that there was very little understanding by the public of NPS philosophy.

IMPACT ISSUES AND TOPICS

Issues associated with white-tailed deer management at Cuyahoga Valley National Park were identified by park staff during the internal scoping meeting at the park using the October 2003 Environmental Screening Form. The issues identified are discussed below.

GEOLOGY AND SOILS

Impact topic (GR1): Impact of Deer Populations on Soils, Streambeds, etc.

Issue: Increased deer browsing decreases vegetation, allowing increased runoff that results in erosion and degradation of geologic resources such as soils and streambeds.

Results of Discussion with Park: There is a potential for stream bank and stream bed erosion due to lack of vegetation and deer trampling.

SOUNDSCAPES

Impact topic (SS1): Impact of Deer Management Strategies on Park Soundscapes

Issue: Certain deer management strategies may cause disturbance to soundscapes.

Results of Discussion with Park: There is a potential for noise disturbance if management methods utilizing firearms or other audible deterrents (i.e., “corn cannons”) are implemented.

WATER QUALITY

Impact topic (WQ1): Impact to Water Quality from Deer Populations

Issue: The removal of ground vegetation through deer browse has the potential to increase stormwater runoff and impact water quality. Increased amounts of deer fecal material could impact water quality.

Results of Discussion with Park: This is a potential issue that should be explored further.

WILDLIFE AND WILDLIFE HABITAT

Impact topic (WW1): Impact of Deer Populations on Wildlife and Wildlife Habitat

Issue: At certain levels, deer populations will have adverse effects on deer and other wildlife and/or habitat by impacting habitat through activities such as browsing, trampling, and seed dispersal.

Results of Discussion with Park: Cuyahoga Valley National Park has conducted studies on the impact of deer density on forest songbirds. This study showed that in areas of high deer density, the abundance of songbirds was less than low-density areas. It is expected that as the deer population rises and browsing of the understory increases, that this trend will continue. In addition to songbirds, deer

can also have an impact on small mammal populations through competition for food such as acorns (McShea 2000). In addition, in 2005 a large number of deer died due to harsh winter conditions, particularly in areas of high density. The deer showed signs of chronic stress, and does that survived were not reproducing.

Impact topic (WW2): Impact of Disease on Wildlife Species and Deer Health

Issue: Diseases that deer are susceptible to could negatively impact other wildlife species or the health of the deer population.

Results of Discussion with Park: Chronic wasting disease, although not found in Ohio, is a potential future concern and the Ohio Department of Natural Resources, Division of Wildlife is preparing for chronic wasting disease. Chronic wasting disease may require quick implementation of management actions and cooperation with the Ohio Department of Natural Resources and the Centers for Disease Control and Protection (CDC) to protect the park deer population. While there have been no cases of chronic wasting disease at Cuyahoga Valley National Park or in the state of Ohio, it has recently been found in Wisconsin and Northern Illinois.

RARE, UNIQUE, THREATENED, OR ENDANGERED SPECIES

Impact topic (TE1): Impact to Rare and Unusual Species or Species of Concern

Issue: Habitat for rare and unusual wildlife species or wildlife species of concern may be vulnerable to impact from high levels of deer browsing activity.

Results of Discussion with Park: Cuyahoga Valley National Park contains 14 breeding bird species, three reptile species, and one mammal species that are of conservation concern in Ohio and could be affected by deer populations.

Impact topic (TE2): Impact to Threatened and Endangered Wildlife Species

Issue: Habitat for federally threatened or endangered wildlife species may be vulnerable to impact from high levels of deer browsing activity.

Results of Discussion with Park: The federally endangered Indiana bat (*Myotis sodalis*) has been documented in Cuyahoga Valley National Park during the summer breeding season. Females and juveniles of this species forage in the airspace near the foliage of riparian and floodplain trees. Males forage in densely wooded areas at tree top height (USFWS 1991). Despite protection at overwintering sites, Indiana bat populations continue to decrease in several portions of their range, indicating disturbance or loss of summer habitat. Because these bats are roosting mainly under exfoliating bark, their summer roosts are short-lived. A continually emerging mosaic of multi-aged trees needs to become available from year to year which can serve as roost sites (BCI 2002). Park staff expressed concern that continued deer browse could impact the habitat of this species.

One breeding pair of bald eagles, which are federally listed as threatened, built a nest inside park boundaries in January 2006. They have not yet laid eggs, but appear to still be a pair and remain in the area. Deer browsing would not likely affect the eagles. If the eagles continue to nest within the park, deer management activities might be restricted within a certain radius of the nest.

Impact topic (TE3): Impacts to State-listed Threatened and Endangered Vegetative Species and Species of Concern

Issue: Habitat for state-listed threatened or endangered plant species may be vulnerable to impact from high levels of deer browsing activity.

Results of Discussion with Park: Within Cuyahoga Valley National Park there are 23 state-listed plant species: four endangered, six threatened, and 13 potentially threatened. If deer browse levels remain high, the threatened and endangered species and species of concern will continue to be impacted.

VEGETATION

Impact topic (V1): Impact to Vegetation Resources

Issue: At certain population levels, deer browsing and activity patterns may adversely affect native plant communities.

Results of Discussion with Park: Deer browsing and other activities are impacting vegetation resources within the park. The park has conducted studies including monitoring of trillium exclosure plots, forest/field exclosure plots, and long-term ecological monitoring to study the impact of deer on park vegetation. These studies consistently show that in areas of high deer density, there are greater impacts to vegetation. Furthermore, the trillium exclosure plots found that individual trillium plants inside the exclosure had a greater probability of flowering than those outside the exclosure, due to deer browse activities.

Impact topic (V2): Impact to Forest Regeneration

Issue: Deer could possibly alter and impact forest regeneration patterns in the park.

Results of Discussion with Park: Continued deer browsing, and other deer activities, are preventing forest regeneration and are changing the composition of the understory. Deer browse is preventing seedlings from growing, potentially increasing survival of less palatable species and altering forest composition.

Impact topic (V3): Impact to Wetland Habitats

Issue: Deer could possibly have negative effects on vegetation in wetland areas through high levels of browsing.

Results of Discussion with Park: Deer feeding in wetland areas may have a negative impact on some rare wetland plant species and hinder on-going riparian buffer restoration efforts.

Impact topic (V4): Impact to Vegetative Species Composition

Issue: Deer activities can promote invasive species through selective browsing, habitat alteration and seed dispersal. An increase in exotic, invasive species could have a negative impact on the park's native plant communities.

Results of Discussion with Park: The National Park Service must consider nonnative plant management in all planning and project development and implementation, and have an integrated pest management program that is adopted and applied throughout the National Park System. The *Control Plan for Alien Plant Species* (NPS 1990) lists seven of the 186 alien plants found in Cuyahoga Valley as potential threats to the native vegetation. These are: Fortune's wild strawberry bush (*Euonymus fortunei*), Japanese honeysuckle (*Lonicera japonica*), purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), giant reed grass (*Phragmites australis*), Japanese knotweed (*Polygonum cuspidatum*), and European alder buckthorn (*Rhamnus frangula*). The park is concentrating management on 4 to 5 of these species in more sensitive areas, such as wetlands. Deer activity, such as browsing and trampling, has the potential to increase seed dispersal and to increase the number and type of invasive species in the park.

LAND USE

Impact Topic (LU1): Impact of Deer Management on Other Park Land Use Plans (i.e., *Rural Landscape Management Program / EIS*)

Issue: Deer management activities need to be consistent with the *Rural Landscape Management Program / EIS*.

Results of Discussion with Park: The *Rural Landscape Management Program / EIS* makes reference to the development of a deer management plan. The deer management plan needs to be consistent with the *Rural Landscape Management Program / EIS,* which identified the Countryside Initiative as the preferred alternative. This program is currently being implemented in the park with three pilot farm operations, which are expected to increase in the future. Future management plans at the park will need to be developed in a manner that is consistent with the deer management plan (for more details, see the Park Plans, Policies, and Actions section on page 27).

Impact Topic (LU2): Impact of Deer Management on Other Park Land Uses

Issue: Deer management approaches need to consider other park land uses, such as farm lessees and the Metro Parks.

Results of Discussion with Park: The park allows farm lessees on park land to build fences and use deterrents to protect crop and agricultural land use. These lessees will be increasing in the park (potentially 1,345 acres of managed federal agriculture in valley in next 10 years).

Five adjacent farmers have crop damage permits to hunt deer within the legislative boundary, and culling occurs on Cleveland Metropark lands within the park's legislative boundary. The Ohio Department of Natural Resources meets with NPS about permits and the park has input on how many deer are allowed to be shot. Most permits allow 10 deer per year. The Department of Natural Resources informs the park if there are any issues with deer permits. There is also potential for other private owners to get permits for other reasons, including personal property damage.

VISITOR EXPERIENCE

Impact topic (VE1): Impact of Deer Management on Visitor Experience Goals

Issue: If deer management activities were to decrease the numbers of deer in the park, chance sightings by visitors would also decrease. Conversely, as the number of deer increase, other resources that visitors come to see, such as songbirds, would decrease.

Results of Discussion with Park: Some visitors to the park may view deer sightings as an integral part of their visit. Deer management actions may decrease the potential for visitors to observe deer within the park, causing less visitor satisfaction. Conversely, there are visitors who come to the park for other resources, such as songbirds. Increased deer browse has the potential to impact these other resources and impact the satisfaction of these visitors.

SOCIAL VALUES

Impact topic (SV1): Impact to Social Values

Issue: The general public has strongly held divergent values and opinions on public policy issues concerning wildlife management. Some people may find lethal management actions offensive, and some animal rights groups have raised objections to lethal control as a method of controlling deer populations.

Results of Discussion with Park: There could be impacts to visitors with animal rights concerns. Some people have specific perceptions of animals, particularly animals in national parks. This could cause a change in their perception of the park, or could cause some visitors to either not visit the park or not enjoy their visit. Some people feel it is not appropriate to take the life of an animal.

CULTURAL LANDSCAPES

Impact topic (CR1): Impact to Cultural Landscapes

Issue: In some cases, the presence and activities of high numbers of deer may affect the character of the cultural landscape.

Results of Discussion with Park: Cuyahoga Valley National Park contains numerous cultural resources including the Ohio & Erie Canal, numerous prehistoric sites, 64 National Register listings including historic districts, historic structures, Civilian Conservation Corps sites, and the Valley Railroad. In addition to these resources, the agricultural landscape of the park is actively managed. Deer browse on crops may prevent these agricultural landscapes from being productive and may alter the landscape itself. As stated in the *Rural Landscape Management Program / EIS*, "preservation of the historic, scenic, natural, and recreational values of the Cuyahoga Valley" is central to the park's legislative mandate. This plan is being implemented under the Countryside Initiative Program (for more details, see the Park Plans, Policies, and Actions section on page 27).

HEALTH AND SAFETY

Impact topic (VC1): Impact to Visitor and Employee Health

Issue: Deer-related diseases may pose health risks to park visitors or area residents.

Results of Discussion with Park: Deer ticks carry Lyme disease, and the CDC has stated that abundant deer and rodent hosts are necessary to maintain the enzootic cycle for the spirochete *Borrelia burgdorferi*. Additionally, chronic wasting disease may eventually become an issue in the park.

Impact topic (VC2): Impact to Visitor and Employee Safety From Deer/Vehicle Collisions

Issue: High densities of deer can cause safety concerns for visitors and employees using park roads.

Results of Discussion with Park: Traffic volume within the park has increased in recent years, and is expected to continue to increase. High densities of deer and an increase in traffic could affect the safety of visitors and employees using park roads, as deer/vehicle collisions have occurred in the past and could increase.

Impact topic (VC3): Impact to Visitor and Employee Safety From Deer Management Activities

Issue: The safety of the public and park employees could be affected by implementation of deer management activities in the park.

Results of Discussion with Park: Deer management activities will need to be conducted in a manner to ensure the safety of park visitors and employees.

SOCIOECONOMIC RESOURCES

Impact topic (SE1): Impact of Deer Management on Local Economy

Issue: Impacts from deer browsing could affect neighboring land users, as well as farmers who are leasing NPS land under the park's Countryside Initiative Program. In addition, there are concerns relating to transmission of disease from deer to domestic animals on local farms.

Results of Discussion with Park: Neighboring landowners may experience crop damage or damage to landscaping from deer moving from park lands onto private property. At least three farmers leasing property under the park's Countryside Initiative Program have erected fences to protect crops from deer. Fences are expensive for the farmers, but essential to farm in the park. Dogs are also used within fenced fields to keep deer out. Some farmers have left the program due to excessive predation. In addition, goats owned by farmers in the NPS program have contracted a parasite believed to be transmitted from deer, and the goats had to be killed as a result.

CUYAHOGA VALLEY NATIONAL PARK MANAGEMENT AND OPERATION

Impact topic (MO1): Potential Conflict with State and Local Ordinances and Policies Regarding Deer Management

Issue: Some states and local governments have taken action, or are considering taking action, to manage deer populations within their jurisdictions. While the park may not be a part of these local actions, consistency with state and local plans must be evaluated.

Results of Discussion with Park: Both the Cleveland Metroparks and Metro Parks, Serving Summit County have taken action to manage deer populations on their lands, including lands that are within the Cuyahoga Valley National Park legislative boundary. Furthermore, the legislative boundary of the park contains many different landowners, including local government, commercial interests, and private landowner interests. Due to the intricate mix of land uses and land ownership within the park, as well as the management activities that are being undertaken by the two metro park organizations, management actions undertaken at Cuyahoga Valley National Park would have to be coordinated with the appropriate local and private entities.

Impact topic (MO2): Impact to Park Staffing and Budget Levels

Issue: Deer management activities have the potential to impact staffing levels and the operating budget necessary to conduct park operations.

Results of Discussion with Park: Park management and operations refers to the current staff available to adequately protect and preserve vital park resources and provide for an effective visitor experience. Additional deer management activities undertaken by park staff could affect other areas of park operations.

Impact topic (MO3): Impact to Park Staff

Issue: Park interpretive or educational staff will need to allocate additional time and resources to enhance public awareness and understanding of NPS resource management issues, policies, and mandates, as they pertain to deer management.

Results of Discussion with Park: Implementing deer management activities will require conducting public outreach efforts on the part of park staff.

ISSUES ELIMINATED FROM FURTHER CONSIDERATION

The following impact topic and/or issue should be removed from consideration:

- Geohazards: There are no known geohazards within the park that would be affected by deer management activities or that would affect deer management activities.
- Air Quality: Impacts from loss of forest cover in a highly urban area are possible; however, this is too speculative in nature to consider or quantify.
- Marine or Estuarine Resources: There are no marine or estuarine resources in this inland park.
- Unique Ecosystems, Biosphere Reserves, World Heritage Sites: There are no known biosphere reserves, World Heritage sites, or unique ecosystems listed in the park.
- Unique or Important Fish or Fish Habitat: There are no known unique fish or fish habitat listed as occurring in the park.

- Energy Resources: The implementation of a deer resources management plan would not be expected to impact energy resources within the park.

- Prime Farmlands: No "unnecessary and irreversible conversion of farmland to non-agricultural uses" (Farmland Protection Policy Act of 1980) is expected under this action. Thus, no impacts to prime and unique farmlands are expected.

- Geothermal Resources: No geothermal resources exist within the park's boundaries.

- Paleontological Resources: No known paleontological resources exist within the park's boundaries.

- Floodplains: No occupancy, modification, or development of floodplains is expected under this plan. The removal of ground vegetation through deer browsing could have the potential to increase stormwater runoff and flood events. However, it was determined that impacts related to an increase in water quantity would be negligible. Therefore, this topic was dismissed from further analysis.

- Archeological Resources: Any impacts to park archeological resources as a result of deer management activities would be negligible. Therefore, this topic was dismissed from further analysis.

- Historic Structures: Although the park contains historic structures, they would not be affected by deer browsing impacts or by proposed actions related to managing deer.

- Museum Collections: None of the proposed actions would affect museum collections.

- Ethnographic Resources: No ethnographic resources or issues have been identified at Cuyahoga Valley National Park.

- Indian Sacred Sites: This plan would not restrict access to Indian sacred sites for ceremonial uses.

- Environmental Justice: The actions under this plan are not expected to have a disproportionate or significant adverse effect on any low income or minority populations in the area.

- Adjacent Land Users: Actions taken under this plan have the potential to affect adjacent land users, including farmers and orchard growers, residence owners, or nearby state parks. Impacts to neighboring land users were determined to be primarily financial; therefore, such impacts are discussed in this plan under the Socioeconomic Resources discussion on page 24. Impacts related to noise are addressed under the Soundscapes Discussion on page 19.

- Socioeconomic Impacts Related to Tourism: Deer management activities have the potential to affect tourism around the park. However, any impacts to tourism are expected to be no more than negligible. Therefore, this topic was dismissed from further analysis.

RELATIONSHIP TO OTHER PLANS, POLICIES, AND ACTIONS

Other plans, policies, and actions at the federal, state, and local level that may affect decisions for deer management within the park were discussed with NPS staff and are provided in the following section.

Existing and future plans and policies at Cuyahoga Valley National Park were also discussed. A brief list of the general plans and policies, and other actions that may be relevant to deer management or cumulative impacts analysis follows.

CUYAHOGA VALLEY NATIONAL PARK PLANS, POLICIES, AND ACTIONS

Past park planning efforts for deer management include the 1997 *Environmental Assessment and Management Plan for White-Tailed Deer*. In addition, Cuyahoga Valley National Park has conducted, and continues to conduct numerous studies to gather data on the park's deer population including spotlight surveys, fecal pellet count surveys, aerial surveys, distance sampling density estimations, herd health studies, dead deer surveys, trillium exclosure plots, general exclosure plots, long-term ecological monitoring, and forest song bird studies.

The park recently completed the *Rural Landscape Management Program Environmental Impact Statement*. Preservation of the rural landscape is central to Cuyahoga Valley National Park's legislative mandate. The term "rural landscape" refers to lands and structures modified by humans for agricultural use. Throughout the park's history, efforts to preserve the rural landscape have been sporadic. As a result, many of the park's rural landscape resources have been lost. Therefore, the park has proposed to better protect and revitalize this cultural resource by implementing an integrated rural landscape management program, with the goal of more effectively and systematically preserving and protecting the rural landscape resources in the park (NPS 2003).

The preferred alternative identified in the EIS, called the Countryside Initiative, is currently being implemented at the park. Under this program, the NPS grants long-term leases of farmsteads and associated fields to private citizens to practice sustainable farming. Three pilot farms have started operations, and it is anticipated that 25-30 farms will occupy approximately 1,350 acres, or 5% of parklands. The farms pursue small, diversified crop and livestock operations that target local specialty and niche markets. The farms are also expected to offer recreational and educational opportunities for park visitors.

Lessee Land Management Practices: The park is allowing farm lessees to build fences and use deterrents to protect crops.

Adjacent Land Owners: Five adjacent farmers have a crop damage permit to hunt deer, within the legislative boundary of the park and hunting on metro park lands within current legislative boundary does occur. The Ohio Department of Natural Resources meets with NPS on permits and the park has input on how many deer allowed to be shot. Most permits allow 10 deer per year. The Department of Natural Resources informs the park if there are any issues with deer permits. There is also potential for other private owners to get permits for other reasons including personal property damage. There is also hunting on private land within the legislative boundary of the park.

Cleveland Metroparks has taken action to decrease deer within national park boundaries. The park is informed of the process. Both Cleveland Metroparks and Metro Parks, Serving Summit County have cooperated with Cuyahoga Valley National Park deer and vegetation monitoring, and also have used NPS studies for justification and assessment of their management actions. Data and information exchange occurs among all three park districts. Metro Parks, Serving Summit County plans to cull deer within the park's legislative boundary in the future.

Resource Management Activities: Soil management includes riverbank stabilization; erosion control where there are potential impacts to cultural resources; riparian buffers re-establishment; and riparian

and wetland buffer restoration plans. Wetland management activities include developing vital signs for wetlands and planning some restoration. Management activities for species of special concern include developing a protection plan for the Indiana bat. Cuyahoga Valley National Park has a rare plant monitoring plan; sites are monitored every 3-5 years to see status. The park would like to develop a rare plant management plan. The park is also planning a grassland and shrub habitat management planning effort associated with the rural landscape plan.

Recreational resource management includes: trail maintenance, basic public use data (traffic counts), visitor satisfaction survey card, and trailhead counts. All of this information is compiled by the communications center. The park has a mow plan for aesthetic and recreational purposes for more than 400 acres of park lands.

Archeological resource management includes: work with Midwest Archeological Center (AC) to keep ASMIS archeological monitoring sites database updated (about 350 sites), and work with law enforcement who monitor some sites. Midwest AC works with staff to survey sites where farming is going on and there is interpretation within the park. Sites are monitored for degradation. There are forms filled out regarding degradation of sites, but no documentation of deer impacts.

A gypsy moth egg mass survey has been conducted annually in the park since 1999. Any defoliation that occurs in the spring is documented and mapped during aerial surveys conducted each summer by the U.S. Forest Service. The Cuyahoga Valley National Park gypsy moth program objectives include reducing long-term impacts of defoliation to the forest ecosystem; protecting the recreational and scenic values of developed visitor use areas and trails from the impacts of defoliation; cooperating with federal, state and local agencies on the suppression of gypsy moths on the lands in and adjacent to the park; providing for the health and safety of visitors, residents and employees; preserving natural controls of gypsy moths whenever feasible; and implementing effective pest management strategies that present the lowest risk to people, park resources and the environment.

Other wildlife management activities in the park include a beaver management plan, a hazardous/ nuisance animal management plan, a coyote population survey, deer-related projects, great-blue heron nest monitoring, a marsh monitoring program, pond monitoring, a butterfly monitoring program, and songbird habitat quality assessment projects. Plant monitoring includes the exclosure studies and the long-term ecological monitoring discussed previously as well as rare plant surveys.

The 1990 Exotic Plant Management Plan includes a program using volunteers to pull, spray, and remove invasive species. Of the 14 invasive species in the park, this plan concentrates on 5-6 species in the most sensitive areas (wetlands and rare plant habitats).

In addition to specific actions related to deer management, the park's enabling legislation calls for the preservation and protection of, "for public use and enjoyment, the historic, scenic, natural, and recreational values of the Cuyahoga River and the adjacent lands of the Cuyahoga Valley." The protection of these resources is accomplished through planning efforts such as the 1977 *General Management Plan*, the 1993 *Statement for Management*, and 2000 *Strategic Plan*.

LOCAL/STATE PLANS, POLICIES, AND ACTIONS

Entities surrounding the park, including those within the legislative boundary of the park, have implemented deer management efforts through culling. Most of these activities have been initiated by the two metro park organizations in the area, Cleveland Metroparks and Metro Parks, Serving Summit County. At Cleveland Metroparks, deer culling is ongoing. In addition to culling efforts, Cleveland

Metroparks is conducting a research project to study the feasibility of reducing the deer herd with a fertility control agent. Metro Parks, Serving Summit County have initiated a sharpshooting program as the primary means of reducing deer densities. At the state level, private land owners can apply for permits that allow out-of-season culling of a set number of deer. Park staff report that five adjacent landowners have crop damage permits that allow them to cull deer on their land.

Future development plans in the surrounding communities could potentially have impacts on park resources either directly through development activities, or indirectly through the alteration of habitat adjacent to the park and increased human population densities. Many communities surrounding the park have comprehensive and land use plans. In Cuyahoga County, the following communities have recently completed or in progress of completing municipal master plans: Valley View (CCCP 2000), Walton Hills (In Progress, CCCP 2003), Bedford (CCCP 1999a), and Garfield Heights (CCCP 1999b). In Summit County, the following communities have a land use/comprehensive plans: City of Stow Comprehensive Land Use Plan, Bath Township Comprehensive Plan, and the Hudson City Parks Master Plan.

On a regional level, the Northeast Ohio Areawide Coordinating Agency, which includes Cuyahoga County, developed a Fiscal Year 2004 Overall Work Program that contains multiple management plans for the area. Applicable resource plans in this document include an Areawide Water Quality Management Plan, Cuyahoga Area of Concern Remedial Action Plan, Watershed and Areawide Nonpoint Source Management Planning, and a Transportation Improvement Program.

Development plans by non-government organizations occurring in the area also have the potential to impact park resources. The Ohio and Erie Canal Corridor Coalition is implementing the Summit County Trail & Greenway Plan-Phase 2, which is a conceptual plan proposing trails and greenways throughout Summit County and creates a network of trails linking communities together and linking communities to the Towpath Trail. CanalWay Ohio, the Ohio and Erie Canal National Heritage Corridor, has a management plan to provide a course of action for interpreting and preserving the resources of the canal. Ongoing actions from other non-profit groups in the area such as the Cuyahoga River Remedial Action Plan & Cuyahoga River Community Planning Organization also affect Cuyahoga Valley National Park.

Various transportation improvements are planned for the area around Cuyahoga Valley National Park on the regional and state level. On a regional level, the Akron Metropolitan Area Transportation Study, which includes Summit County, includes the 2025 Regional Transportation Plan for the Akron metropolitan area. This plan calls for a variety of highway projects in Cuyahoga Falls, Stow, Hudson, and northern Summit County. These projects include road widening, lane reconfigurations, adding turn lanes, and coordinating signal timing. Transportation improvements for the Northeast Ohio Areawide Coordinating Agency, which includes Cuyahoga County, are included in the Fiscal Year 2004 Overall Work Program, as discussed above.

The Ohio Department of Transportation has a variety of proposed, planned, or on-going projects in and around Cuyahoga Valley National Park. Projects include the reconstruction of I-480 from Idlewood Road to Tuxedo Avenue and the Route 8 upgrade in Summit County, a project which proposes to turn the road into a limited-access highway between I-271 and State Route 303. Construction is also underway or planned for I-80, I-271, and State Route 8 within park boundaries.

PRELIMINARY ALTERNATIVES

Alternatives at a minimum must meet objectives to a large degree, while meeting the purpose of and need for action. See Director's Order 12, 2.7; 4.5 (EIS); 5.3 (EA)

The discussion of preliminary alternatives during the internal scoping meeting focused on the components or potential actions that could become part of an alternative. The discussion did not proceed to the point where a complete set of alternatives could be formulated. Therefore, this chapter describes the no-action alternative and *preliminary* action alternatives as they were developed during the internal scoping meeting. All alternatives must be consistent with the purpose and significance of Cuyahoga Valley National Park and NPS law and policy, and must meet the purpose of and need for action, as well as the management objectives. The preliminary action alternatives address different methods to manage deer populations in order to achieve specific management objectives. The alternatives could be used individually or in some combination that would be appropriate for achieving the management objectives. The alternatives may be further developed using the following list and other issues derived from public and additional agency scoping.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

The following actions would be common to all alternatives.

- The best available science will be used to determine appropriate management actions. The management plan will be adaptive, allowing for incorporation of new information over time to affect management actions.

- The scientific monitoring and modeling methods currently underway in the park would be used to determine what population threshold the park is trying to achieve. This would include continuation of monitoring for both vegetation impacts and deer population in order to correlate impact levels with deer population numbers. Indicator species or trends would be developed as part of this planning process and applied to all of the action alternatives.

- Addressing white-tailed deer management with a cooperative regional approach would involve both Metro Parks districts, the Ohio Division of Wildlife, county and local governments, as well as non-governmental organizations. Combined efforts of implementing alternatives for deer management could include city and local government zoning and other regulations; state wildlife agencies increasing harvest limits; and/or farmers altering crop types or providing access for sport hunting (Coffey and Johnston 1997). Therefore, each alternative would include coordination with other jurisdictional entities currently implementing deer management actions for the benefit of protection of park resources and values.

- Education and interpretive measures, in accordance with the *Long-Range Interpretive Plan*, would be implemented and could involve various efforts including:

    - Expansion of existing deer management information on park website

    - Brochures/publications

- Assistance of other organizations

ALTERNATIVE A—NO ACTION

As required under CEQ regulations 40 CFR 1502.14(d) the alternatives analysis in an EIS must "include the alternative of no action." According to the CEQ, there are two distinct interpretations of "no action" that must be considered, depending on the nature of the proposal being evaluated. The first situation might involve an action such as updating a land management plan where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases "no action" is (CEQ FAQs, n.d.):

> "no change" from current management direction or level of management intensity. To construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the "no action" alternative may be thought of in terms of continuing with the present course of action until that action is changed. Consequently, projected impacts of alternative management schemes would be compared in the EIS to those impacts projected for the existing plan. In this case, alternatives would include management plans of both greater and lesser intensity, especially greater and lesser levels of resource development.

As a mandated alternative, the no action alternative "sets a baseline of existing impact continued into the future against which to compare impacts of action alternatives" (Director's Order 12, Section 2.7). Under the no action alternative, no management actions would be undertaken to manage deer populations or their impacts to resources within Cuyahoga Valley National Park (see History of Deer MONITORING and Research at Cuyahoga Valley National Park on page 12). Current monitoring efforts would continue to record deer impacts and deer population numbers within the park. Other existing resource management efforts within the park would continue. The proposed action alternatives will be compared to the existing management actions. Currently, deer management on NPS lands within the park includes only fencing and repellents. However, deer management (including fencing, repellents, and direct population reduction) occurs within the park legislative boundary on non-federal land. Under a no action alternative, those management actions would continue. Current deer-related monitoring activities in Cuyahoga Valley National Park include:

- Annual spotlight surveys
- Trillium Exclosure Plots (1996) fourteen sites
- Exclosure Plots: 3 sites (1991); 12 added (1999)
- Long-Term Ecological Monitoring (Vegetation & Tree Regeneration) (1998)

In addition, park resource management goals are outlined in the 1999 *Draft Resource Management Plan.* In addition to actively monitoring the deer population and implementing the goals of the *Draft Resource Management Plan* within Cuyahoga Valley National Park, additional resource monitoring and management in the park that has relevance to deer management issues includes (see Cuyahoga Valley National Park Plans, Policies, and Actions on page 27):

- Gypsy Moth Management (2000)

- Alien Plant Control (1990)
- Coyote Population Monitoring (1993)
- Riparian Buffer Establishment (Agricultural lands; 2002)
- Wetland Protection (Agricultural lands; 2002)
- Rare Plant Monitoring (2002)
- Rural Landscape Management Program (2003)

These management efforts will continue under the no action alternative.

ALTERNATIVE B—HABITAT MANAGEMENT

Under alternative B, habitat management would be undertaken in those areas where direct habitat manipulation is feasible. Habitat management approaches that could influence deer populations and reduce impacts over the long-term would include methods that reduce the availability of high quality forage in the landscape. Such approaches could include: fencing or restoring old field areas in strategic locations to allow succession to forest, thereby reducing the total acreage of non-forested land and creating larger blocks of contiguous forest. Agricultural practices within the park could be changed to either reduce total acreage or change the types of crops planted to types that are less palatable to deer. Fencing of agricultural areas as described in Alternative B also would effectively remove these areas from the landscape for foraging deer.

In addition, the park could work with communities and other land management entities within and adjacent to the park to encourage the maintenance or increase of forest cover and decrease of fragmentation in the region through such methods as conservation easements, zoning changes, incorporation of conservation biology principles into developmental planning, and purchase of additional lands for preservation.

ALTERNATIVE C—FENCING

Fencing landscape plants and crops is an effective way to eliminate deer browsing (API 2000). Fencing is most successful for smaller areas of vegetation such as small orchards and gardens (Maryland DNR 2002). Cuyahoga Valley National Park covers more than 33,000 acres and includes relatively undeveloped land situated between two major metropolitan areas, Cleveland and Akron, and surrounded by residential and industrial development and transportation corridors. Within the legislative boundary, the National Park Service owns approximately 18,600 acres. Most of the remaining area is owned and managed by public and quasi-public entities. A little more than 4,000 acres are owned by private individuals. The alternative of fencing the entire perimeter of the park is not feasible due to public accessibility, cost, and maintenance requirements; however, fencing could be used in select locations to protect agricultural plots and/or sensitive cultural and natural resource areas from deer browsing. The fence would need to be a minimum height of 8 feet to be effective in preventing deer from jumping the fence.

ALTERNATIVE D—REPRODUCTIVE CONTROL

Reproductive controls can generally be divided into contraception (i.e., preventing conception) and contragestation (i.e., preventing gestation or pregnancy). Currently, there are three methods biologists utilize to inhibit deer conception (Winand n.d.):

- Surgical sterilization in the field, which is generally cost prohibitive.

- Synthetic hormones (either digested or implanted) that cause deer to inhibit or block any stimulations from the brain for ovulation to occur. Research has shown that certain physiologically inert subcutaneous (implanted under the skin) contraceptives can last up to two years. The disadvantage to this method is the cost and time involved in trapping/handling and implanting the deer. Additionally, the same deer will have to be trapped every year or two. Furthermore, to effectively prevent pregnancy, the implants must be imbedded prior to the breeding season when food is plentiful and deer are most difficult to trap.

- Immunocontraception which "vaccinates" deer to stimulate the immune system to produce antibodies against certain proteins involved in fertilization. Immunocontraception is the most widely used method and has the best potential for use in urban environments.

Contraceptive methods that utilize either supplemental steroid hormones or immunocontraceptive vaccines have successfully prevented conception in individually treated deer (Warren 2002). Immunocontraception cause females to produce antibodies that prevent sperm from penetrating and fertilizing the egg. There are three methods of administering these agents: oral ingestion, subcutaneous (under the skin) implants and injected darts/syringes (Winand n.d.). Oral delivery is a method where the contraceptive is contained within a bait source such as corn (Winand n.d.). Females must be treated twice the first year, and must receive a booster shot each subsequent year of the program. Females also must be treated just before the breeding season (Ramakrishnan 2002).

ALTERNATIVE E—DIRECT REDUCTION

ALTERNATIVE E1—SHARPSHOOTING

Under alternative E1, NPS personnel or authorized agents of the park would shoot deer to reduce the population. Only people that are highly skilled and trained in the use of firearms and public safety would participate in the reduction. Bait stations may be used to attract deer, and would be placed away from buildings and from public use areas. High-powered rifles with sound suppressors would be used from close range. Every effort would be made to make the shootings as humane as possible and minimize suffering to deer as well as to reduce disturbance to the public. Compliance with all federal firearm laws administered by the Bureau of Alcohol, Tobacco, and Firearms would be required.

The action would occur during fall and winter months when deer are more visible in the park to reduce the amount of time required to complete the action. The public would be notified of timing and methods of the management action well in advance of the activities. In addition, information would be displayed at visitor centers and posted on the park's website to educate the public regarding deer

management actions. Every effort would be made to ensure safety of the public. Visitor access would be restricted as necessary during the time the reduction is taking place and the park would be patrolled by NPS law enforcement to ensure public safety.

Harvested deer would be collected, field-dressed, processed, and stored in a manner consistent with federal and state laws and regulations. Data such as age, weight, and sex would be recorded on each deer. Venison would be donated to local charity organizations.

ALTERNATIVE E2—TRAP AND KILL

Under alternative E2, deer would be trapped using a standard capture method (e.g. baited box traps, clover traps, or drop nets) and subsequently euthanized by head shots using a firearm or penetrating captive bolt gun in accordance with guidelines of the American Veterinary Medical Association.

Euthanized deer would be field-dressed, processed, and stored in a manner consistent with federal and state laws and regulations. Data such as age, weight, and sex would be recorded on each deer. Venison would be donated to local charity organizations.

ALTERNATIVE F—COMBINED MANAGEMENT

Under Alternative F, a combination of alternatives would be used to manage deer. These management techniques are discussed in detail as either stand-alone alternatives or alternatives considered but not carried forward as stand-alone alternatives (see page 34). For example, fencing (alternative C) could be used to protect sensitive areas, such as areas of rare plants, or agricultural plots farmed under the Countryside Initiative. The park could work with Cleveland Metroparks or on their own to manage deer through a reproductive control study (alternative D) to test the applicability of the method at the park. If effective and cost efficient, or if reproductive methods advance, the reproductive control program would be implemented in new areas where feasible. Direct reduction (alternative E) could be used in sections of the park if it is determined that immediate reduction is necessary due to unacceptable resource damage. Direct reduction could continue to be used to prevent unacceptable resource damage even in areas with fencing or reproductive control as necessary over the long term.

Chemical repellents and the selection of plants that are not palatable to deer, two alternatives considered but not carried forward as stand-alone alternatives, may be good options for use with other management techniques. There are two types of repellents: contact and area. These repellents can be sprayed on or attached to nearby vegetation, thus protecting individual plants or larger areas (Coffey and Johnston 1997). Visual and sound deterrents are also available to scare deer away from areas (API 2000).

Efforts to decrease the amount of forest fragmentation and increase total forest cover within and adjacent to the park (alternative B) would assist with long-term regulation of deer populations.

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Other potential alternatives for consideration broached during internal scoping follow. These alternatives were eliminated due to the reasons provided.

REINTRODUCTION OF PREDATORS

This alternative is not feasible at Cuyahoga Valley National Park due to a lack of suitable habitat that is sizable enough to support populations of large predators such as gray wolves or cougars which are capable of controlling deer populations. Coyotes (*Canis latrans*) are present in the park and bobcats (*Lynx rufus*) potentially could be supported by habitats within the park. However, these predators have been shown not to exert effective control on white-tailed deer populations (Coffey and Johnston 1997). Moreover, the park is surrounded by developed area and the proximity to humans is not appropriate for reintroduction of wolves or cougars.

RELOCATION

Live-capture of white-tailed deer and their relocation to another environment may be considered when dealing with small deer populations. Live-capture and relocation as an alternative may have limited success in controlling a small, isolated population, or in removing animals from one area to augment populations in other areas where the deer population is below desired levels (Coffey and Johnston 1997). The Ohio Division of Wildlife will not issue permits for relocation of deer because there are no properties in Ohio where deer can be relocated (Metro Parks, Serving Summit County, n.d.). A state permit would be required to transport live animals over state roadways. Live-capture and relocation can be stressful (DeNicola and Swihart 1997) and result in high mortality rates in the relocated deer (Warren 2002).

PUBLIC HUNTING

Public hunting has been considered and rejected based on legal and policy constraints. The NPS has a legislative mandate to protect the natural and cultural resources within national parks; it does not have a mandate to allow public hunting in parks. In the NPS units where Congress intended to allow hunting, it has been specifically authorized. Consistent with this approach, the history, policies, and regulations of the NPS clearly show that the NPS has interpreted the Organic Act to mean that hunting should not be allowed in national parks unless specifically authorized by Congress. Courts have upheld this interpretation as reasonable, and the NPS recently re-affirmed its no-hunting policy in its 2001 management policies. Therefore an alternative that would allow hunting in national parks where Congress has not already specifically authorized hunting, is not likely to be implemented. Because the prospect that the NPS will change its long-standing regulations and policies regarding hunting is remote and speculative, and because hunting in national parks without Congressional authorization is in conflict with the basic policy objectives of the NPS, an alternative that allows public hunting in national parks has been considered and rejected.

REPELLENTS, PLANTINGS (SACRIFICIAL AND REPLACEMENT), AND OTHER DETERRENTS—PARK WIDE

Chemical repellents and the selection of plants that are not palatable to deer are good options for individual homeowners to discourage deer from destroying residential yards and gardens. There are 2 types of repellents: contact and area. These repellents can be sprayed on or attached to nearby vegetation, thus protecting individual plants or larger areas (Coffey and Johnston 1997). Repellents are removed by rainfall, requiring repeated applications. When deer numbers approach biological carrying

capacity, repellents may be totally ineffective (Maryland DNR 2002). Therefore, it would be impractical to effectively manage deer in a large natural park setting.

Visual and sound deterrents are also available to scare deer away from areas (API 2000). Again, visual and sound deterrents would be impractical in a large park setting and could have impacts on visitor experience.

SUPPLEMENTAL FEEDING

Providing supplemental food to deer as a way of reducing damage to natural or ornamental vegetation is often suggested. Increasing food sources through supplemental feeding could increase survivability and reproduction, thus compounding problems that already exist. Providing alternative food sources may provide temporary relief from browsing on plants needing protection, but will not provide a long-term solution. In addition, supplemental feeding on a region-wide basis would be logistically and economically impractical (Maryland DNR 2002).

PARASITE OR DISEASE INTRODUCTION

The risks and uncertainties associated with parasite or disease introduction make it impractical. Several parasites and diseases kill deer, but almost none are specific to deer. Other wildlife or livestock could be adversely affected if this method were used to reduce deer numbers (Bishop et al. 1999).

POISONS

Currently, there are no toxicants, poisons or lethal baits registered for deer control. Quick-acting lethal chemicals are available, but there are no safe methods for delivering lethal dosages to free-ranging deer. The use of toxicants carries many hidden risks that may be socially unacceptable. These include potential human health risks, particularly if poisoned free-roaming deer occur in areas open to legal hunting as well as risks to non-target animals, including pets, that might eat baits or scavenge carcasses of poisoned deer (Bishop et al. 1999).

AFFECTED ENVIRONMENT

DO-12 says (in accordance with NPOMA) that if information critical to decision-making is lacking, then the action should be modified to eliminate that portion of the action where impacts are uncertain. In addition, NEPA and CEQ specify what must be done in the absence of info: "When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking" (Section 1502.22). The "Affected Environment" should state clearly what information is available, where conflicts exist in the data/interpretation, and what information is lacking.

See Director's Order 12 Handbook 2.8; and Director's Order 12 4.4 and 4.5 (unavailable information and use of technical and scientific analysis in decision-making).

The following resources have been collected or will be collected on deer management at Cuyahoga Valley National Park. These documents and other references, as well as other relevant documents from the previous deer management planning efforts at the park (1997 Environmental Assessment Administrative Record), will be used to prepare the Affected Environment section of the environmental impact statement. In addition, the park will provide an annotated bibliography from Cleveland Metroparks.

LEGISLATION

NPS 1992 *A Green Shrouded Miracle: The Administrative History of Cuyahoga Valley National Recreation Area, Ohio*

NPS 2001 *Title 16 – Conservation, Chapter 1 – National Parks, Military Parks, Monuments, and Seashores, Subchapter XC – Cuyahoga Valley National Park – Section 460ff Establishment*

CUYAHOGA VALLEY NATIONAL PARK PLANNING DOCUMENTS

NPS 1977 *General Management Plan*

NPS 1993 *Statement for Management*

NPS 1997 *Strategic Plan with Deletions*

NPS 1999 *Draft Resource Management Plan*

NPS 2000 *Strategic Plan for Cuyahoga Valley National Recreation Area*

NPS 2003 *Rural Landscape Management Program Final Environmental Impact Statement, Cuyahoga Valley National Park, Ohio*

NPS 2003 *Long-Range Interpretive Plan*

CUYAHOGA VALLEY NATIONAL PARK RESOURCE INFORMATION

FTA-DOT 1999 Cuyahoga Valley National Recreation Area Federal Lands Alternative Transportation Systems Study Field Report

NPS 1990-Present *Annual Deer Spotlight Survey Results*

NPS 1996-Present *Annual Deer Fecal Pellet Count Survey Results*

NPS 1996-1998 *Aerial Survey Results*

NPS 1998-Present *Annual Distance Sampling Density Estimation* Results

NPS 1997-2000 *Forest Song Bird Study Results*

NPS 1997 *Dead Deer Survey Results*

NPS 1997 *Draft Environmental Assessment and Management Plan for White-Tailed Deer*

NPS 1997 *Final Environmental Assessment and Management Plan for White-Tailed Deer*

NPS 1997 *Administrative Record of the Environmental Assessment and Management Plan for White-Tailed Deer*

NPS 1998 *Long-Term Ecological Monitoring Study Results*

NPS 2002 *Cuyahoga Valley National Park 2001 Deer Exclosure Report*

NPS 2002 *White-Tailed Deer Population Distribution Monitoring Report Winters 1995-96 and 1996-97*

NPS 2002 *The Effects of Deer Browsing on White Flowered Trillium in Cuyahoga Valley National Park*

NPS 2002 *Cuyahoga Valley National Park Service Visitor Report*

NPS 2002 *Rural Landscape Management Program Draft Environmental Impact Statement, Cuyahoga Valley National Park, Ohio*

NPS 2002 *White-Tailed Deer in Cuyahoga Valley National Park*

NPS 2003 *Cuyahoga Valley National Park Species List*

NPS 2003 *Invasive Plants in CVNP*

ODNR 2003 *Deer Damage Control*

ODNR 2003 *Chronic Wasting Disease (CWD) Not Found in Ohio's Deer Herd*

ODNR 2003 *State Wildlife Biologists Develop New Method of Estimating Ohio's Deer Population*

Richner 1997 *Archeological Inventory at Two Historic Farms at Cuyahoga Valley National Recreation Area, Bath and Northampton Townships, Summit County, Ohio 1994*

University of Minnesota 2001 *Deer Management in Cuyahoga Valley National Park: A Study of Local Residents' Attitudes*

USGS 2001 *Health Assessment of White-Tailed Deer of the Cuyahoga Valley National Park, Ohio*

The park was asked to provide the relevant documents/data for the purposes of this EIS.

ENVIRONMENTAL CONSEQUENCES

Important changes have been made in the way the National Park Service analyzes, describes, and documents (formats) its NEPA analysis. It is mandated by DO-12 (see 4.5 (g)).

Using the best available data, the context, duration, and intensity of impacts, including cumulative impacts, must be defined. NPS must systematically analyze the impact of each alternative in terms of its context, duration, and intensity of effect on unit resources and values and based on this analysis determine the potential for impairment.

The park was briefed on what methods could be used for impact assessment, and how they will be involved in setting up the criteria for impact intensity. The impact methodology, defined by DO-12 § 4.5(G)(7)(a), describes methods used to determine impact.

1. *Explain any assumptions.*
2. *Define or explain how data will be interpreted.*
3. *Describe thresholds used to measure context.*
4. *Duration and intensity of impacts.*

Impact indicators must be set up for each impact topic.

For each resource, thresholds help to establish the sideboards for understanding the severity and the magnitude of the impact. Example of intensity: Impact to vegetation from deer management.

- **Negligible impacts**: Impacts would have no measurable or perceptible changes in plant community size, integrity, or continuity.
- **Minor impacts**: Impacts would be measurable or perceptible but would be localized within a relatively small area. The overall viability of the plant community would be affected and, if left alone, would recover.
- **Moderate impacts**: Impacts would cause a change in the plant community (e.g., abundance, distribution, quantity, or quality); however, the impact would remain localized.
- **Major impacts**: Impacts to the plant community would be substantial, highly noticeable, and permanent.
- **Impairment**: Deer populations would contribute substantially to the deterioration of vegetation to the extent that park plant communities would no longer function as a natural system. In addition, these adverse major impacts to park resources and values would:
    - Contribute to deterioration of the rich biodiversity within the park to the extent that the park's purpose could not be fulfilled as established in its enabling legislation;

- Affect resources key to the park's natural or cultural integrity or opportunities for their enjoyment; or

- Affect the resource whose conservation is identified as a goal in the park's general management plan or other park planning documents.

Results of Discussion with Park: Preliminary discussion occurred with park staff on impact analysis, particularly related to establishment of measurable thresholds. Prior to the initiation of the draft environmental impact statement, methodologies and impact thresholds that are appropriate for measuring impacts to park resources will be presented and discussed with park staff.

CONSULTATION AND COORDINATION

In 1993, Cuyahoga Valley National Park (then a National Recreation Area) joined the Deer Management Task Force (DMTF) established by the Cuyahoga Valley Communities Council. The DMTF was composed of eleven representatives from six local municipalities and townships, the park, Metro Parks, the Ohio Farm Bureau, and the Ohio Department of Natural Resources. The task force studied the issue of the deer population within a 178 square mile area of concern, which included private, federal, and Metro Parks lands. The DMTF's recommendations were presented to Cuyahoga Valley Communities Council in 1996. There was public support for deer population control. A DMTF public survey found that 52 percent of respondents agreed that problems warranted control; however, the survey item did not suggest a type of control method.

Following the 1997 efforts to institute a deer management plan at the park, Cuyahoga Valley National Park conducted a public survey as part of a larger effort to assess the deer populations, the natural and social effects of the increased number of deer, as well as the potential biological, social, and psychological impacts of deer management. A mail-back survey was sent to 1,800 residents living in a nine county area surrounding the park. This study was conducted by the University of Minnesota (Dougherty et al. 2001) to quantify the social attitudes of those adjacent to and further removed from Cuyahoga Valley National Park. The study found that the majority of the respondents supported deer management, including lethal methods. Furthermore, the majority of respondents trust NPS in their decision making on this issue. Although the study found support, it did show a disconnect between public perception for the need for deer management (i.e., reduce automobile accident, browsing on landscape plants, etc.) and the park's perception (i.e., preserve and protect native species). The survey also found that there was very little understanding by the public of the NPS philosophy.

The institution of a technical advisory committee was discussed with the park and will be seriously considered. A technical advisory committee would be established to provide guidance and assist in decision-making regarding monitoring protocols and impact thresholds to determine when, where, and what type of management action should be taken. The committee will be made up of park staff, natural resource experts, and public agency personnel.

Incorporating public opinion into wildlife management planning has become critical to contemporary wildlife management. Failure to respond to public opinion may jeopardize biologically sound wildlife management programs (Henderson et al. 2000). Future public scoping efforts will potentially include public meetings or open houses, newsletters, workshops, and dissemination of information and gathering of comments through the internet. A public participation plan will be developed for the park. An example outline for a public participation plan may be found in appendix A.

Consultation with state and federal agencies will occur during the planning process. The following is a preliminary list of individuals, groups and agencies that are likely to be contacted during the deer management plan development and scoping activities (revised from *Rural Landscape Management Program / EIS*):

CONGRESSIONAL DELEGATES

FEDERAL AGENCIES

- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency

STATE AND LOCAL AGENCIES OR GOVERNMENTS

- Ohio Department of Agriculture
- Ohio Environmental Protection Agency
- Ohio Department of Natural Resources
- Ohio Historical Society (State Historic Preservation Officer)
- Cleveland Metroparks
- Metro Parks, Serving Summit County
- Cuyahoga County
- Cuyahoga County Planning Commission
- Summit County
- 15 municipalities including:
    - City of Akron
    - City of Bedford
    - City of Brecksville
    - City of Cuyahoga Falls
    - City of Fairlawn
    - City of Hudson
    - City of Independence
    - City of Valley View
    - Northfield Center Township

- Richfield Township
- Sagamore Hills Township
- Village of Boston Heights
- Village of Peninsula
- Village of Richfield
- Village of Walton Hills

INDIAN TRIBES

ORGANIZATIONS/OTHER

- Blossom Music Center
- Boston Mills/Brandywine Ski Resorts
- Boy Scouts of America
- Center for Farmland Preservation in Northeast Ohio
- Cuyahoga Valley Communities Council
- Cuyahoga Valley Countryside Conservancy
- Cuyahoga Valley National Park Association (CVNPA)
- CVNPA Environmental Education Center
- Girl Scouts of America
- Greater Akron Audubon Society
- Hale Farm
- Heritage Farms
- Kirtland Bird Club
- National Parks and Conservation Association
- Ohio & Erie Canal Corridor Coalition
- Ohio Canal Corridor
- Ohioans for Animal Rights

- Phyllis Wheatly Association
- Sierra Club
- Stanford Youth Hostel
- The Humane Society of the United States
- The Nature Conservancy
- Western Cuyahoga Audubon Society

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